

## APPENDIX - MODELING INTERNATIONAL TRADE OF FOREST PRODUCTS: APPLICATION OF PPML TO A GRAVITY MODEL OF TRADE

### A. Coefficient estimates

Table A-1: Regression results for item categories 1619, 1632, and 1634.

	VARIABLES	OLS $\ln(\text{exports})$	OLS $\ln(\text{exports})$	OLS $\ln(\text{exports})$	PPML $\text{exports}$	PPML $\text{exports}$	PPML $\text{exports}$
1619 Chips and Particles	$\ln(\text{exporter GDP})$	0.0532*** (0.0175)	-0.218 (0.147)	0.388*** (0.0748)	0.122 (0.0999)	2.801*** (0.701)	0.695 (0)
	$\ln(\text{importer GDP})$	0.629*** (0.0168)	0.688*** (0.131)	0.861*** (0.0702)	0.926*** (0.0450)	2.339*** (0.356)	1.667 (0)
	$\ln(\text{distance})$	-0.718*** (0.0285)	-1.431*** (0.0354)	-1.573*** (0.0407)	0.230 (0.291)	-3.013*** (0.166)	-1.863 (0)
	Constant	7.642*** (0.262)	15.64*** (3.208)	3.647*** (0.668)	1.330 (2.207)	15.28*** (2.234)	0.392 (0)
	Observations	11,013	11,013	11,013	39,542	39,542	32,574
	R-squared	0.145	0.453	0.559	0.002	0.898	0.999
1632 Sawnwood (Coniferous)	$\ln(\text{exporter GDP})$	0.195*** (0.00818)	-0.378*** (0.0608)	0.309*** (0.0261)	0.513*** (0.0179)	0.183** (0.0913)	0.515*** (0.0801)
	$\ln(\text{importer GDP})$	0.376*** (0.00762)	0.724*** (0.0575)	0.504*** (0.0249)	1.073*** (0.0719)	1.587*** (0.120)	1.428*** (0.299)
	$\ln(\text{distance})$	-0.662*** (0.0150)	-1.494*** (0.0170)	-1.524*** (0.0179)	-1.131*** (0.0681)	-1.609*** (0.0426)	-1.597*** (0.0663)
	Constant	8.249*** (0.133)	13.72*** (0.801)	6.649*** (0.230)	9.184*** (0.432)	9.796*** (0.799)	2.694 (2.149)
	Observations	36,007	36,007	36,007	100,770	100,770	94,555
	R-squared	0.099	0.484	0.535	0.496	0.918	0.922
1634 Veneer Sheets	$\ln(\text{exporter GDP})$	0.211*** (0.00606)	0.447*** (0.0501)	0.275*** (0.0234)	0.435*** (0.0266)	1.315*** (0.169)	0.410*** (0.123)
	$\ln(\text{importer GDP})$	0.430*** (0.00621)	0.777*** (0.0500)	0.542*** (0.0247)	0.861*** (0.0434)	0.554*** (0.208)	1.021*** (0.0591)
	$\ln(\text{distance})$	-0.489*** (0.0113)	-1.032*** (0.0137)	-1.037*** (0.0141)	-0.758*** (0.0564)	-1.391*** (0.0330)	-1.274*** (0.0362)
	Constant	4.820*** (0.103)	7.023*** (0.668)	1.174*** (0.219)	5.112*** (0.316)	5.393*** (0.860)	0.819 (0.779)
	Observations	34,542	34,542	34,542	90,946	90,946	84,497
	R-squared	0.144	0.401	0.476	0.207	0.657	0.850
	Effects	Year	Country	Country* Year	Year	Country	Country* Year

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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Table A-2: Regression results for item categories 1640, 1646, and 1651.

VARIABLES	<b>OLS</b> <i>ln(exports)</i>	<b>OLS</b> <i>ln(exports)</i>	<b>OLS</b> <i>ln(exports)</i>	<b>PPML</b> <i>exports</i>	<b>PPML</b> <i>exports</i>	<b>PPML</b> <i>exports</i>
1640 Plywood	<i>ln(exporter GDP)</i> 0.228*** (0.00702)	<i>ln(exporter GDP)</i> 0.623*** (0.0485)	<i>ln(exporter GDP)</i> 0.313*** (0.0239)	<i>ln(importer GDP)</i> 0.551*** (0.0192)	<i>ln(importer GDP)</i> 0.941*** (0.153)	<i>ln(importer GDP)</i> 0.453*** (0.0461)
	<i>ln(importer GDP)</i> 0.361*** (0.00585)	<i>ln(importer GDP)</i> 0.614*** (0.0465)	<i>ln(importer GDP)</i> 0.487*** (0.0213)	<i>ln(distance)</i> -0.317*** (0.0220)	<i>ln(distance)</i> 0.725*** (0.187)	<i>ln(distance)</i> 1.031*** (0.132)
	<i>Constant</i> 5.571*** (0.110)	<i>Constant</i> 9.454*** (0.661)	<i>Constant</i> 4.307*** (0.201)	<i>Constant</i> 2.903*** (0.383)	<i>Constant</i> 3.688*** (0.867)	<i>Constant</i> 0.451 (0.931)
	<i>Observations</i> 43,021	<i>Observations</i> 43,021	<i>Observations</i> 43,021	<i>Observations</i> 112,768	<i>Observations</i> 112,768	<i>Observations</i> 106,658
	<i>R-squared</i> 0.104	<i>R-squared</i> 0.484	<i>R-squared</i> 0.553	<i>R-squared</i> 0.066	<i>R-squared</i> 0.428	<i>R-squared</i> 0.594
	<i>ln(exporter GDP)</i> 0.278*** (0.00892)	<i>ln(exporter GDP)</i> 0.657*** (0.0685)	<i>ln(exporter GDP)</i> 0.498*** (0.0334)	<i>ln(importer GDP)</i> 0.554*** (0.0161)	<i>ln(importer GDP)</i> 0.504*** (0.115)	<i>ln(importer GDP)</i> 0.611*** (0.0735)
1646 Particle Board	<i>ln(importer GDP)</i> 0.343*** (0.00693)	<i>ln(importer GDP)</i> 0.799*** (0.0606)	<i>ln(importer GDP)</i> 0.484*** (0.0268)	<i>ln(distance)</i> -1.729*** (0.0705)	<i>ln(distance)</i> 1.024*** (0.0975)	<i>ln(distance)</i> 1.319*** (0.255)
	<i>ln(distance)</i> -1.108*** (0.0146)	<i>ln(distance)</i> -1.636*** (0.0181)	<i>ln(distance)</i> -1.729*** (0.0185)	<i>ln(distance)</i> -1.579*** (0.0507)	<i>ln(distance)</i> -1.918*** (0.0299)	<i>ln(distance)</i> -1.944*** (0.0311)
	<i>Constant</i> 10.37*** (0.123)	<i>Constant</i> 13.99*** (1.072)	<i>Constant</i> 6.204*** (0.254)	<i>Constant</i> 10.39*** (0.397)	<i>Constant</i> 9.913*** (0.839)	<i>Constant</i> 3.260* (1.791)
	<i>Observations</i> 31,918	<i>Observations</i> 31,918	<i>Observations</i> 31,918	<i>Observations</i> 88,869	<i>Observations</i> 88,869	<i>Observations</i> 82,692
	<i>R-squared</i> 0.178	<i>R-squared</i> 0.386	<i>R-squared</i> 0.488	<i>R-squared</i> 0.303	<i>R-squared</i> 0.838	<i>R-squared</i> 0.967
	<i>ln(exporter GDP)</i> 0.142*** (0.0113)	<i>ln(exporter GDP)</i> -0.442*** (0.0953)	<i>ln(exporter GDP)</i> 0.237*** (0.0437)	<i>ln(importer GDP)</i> 0.432*** (0.0231)	<i>ln(importer GDP)</i> -0.580*** (0.118)	<i>ln(importer GDP)</i> 0.592*** (0.176)
1651 Industrial Roundwood (Confierous)	<i>ln(importer GDP)</i> 0.395*** (0.0110)	<i>ln(importer GDP)</i> 0.694*** (0.0931)	<i>ln(importer GDP)</i> 0.620*** (0.0478)	<i>ln(distance)</i> 0.743*** (0.0228)	<i>ln(distance)</i> 1.149*** (0.129)	<i>ln(distance)</i> 0.932*** (0.165)
	<i>ln(distance)</i> -0.752*** (0.0210)	<i>ln(distance)</i> -1.474*** (0.0273)	<i>ln(distance)</i> -1.567*** (0.0305)	<i>ln(distance)</i> -0.743*** (0.0459)	<i>ln(distance)</i> -2.420*** (0.0702)	<i>ln(distance)</i> -2.111*** (0.120)
	<i>Constant</i> 8.749*** (0.187)	<i>Constant</i> 13.32*** (1.066)	<i>Constant</i> 6.015*** (0.393)	<i>Constant</i> 8.536*** (0.492)	<i>Constant</i> 18.14*** (0.979)	<i>Constant</i> 8.178*** (1.990)
	<i>Observations</i> 18,291	<i>Observations</i> 18,291	<i>Observations</i> 18,291	<i>Observations</i> 64,170	<i>Observations</i> 64,170	<i>Observations</i> 56,121
	<i>R-squared</i> 0.114	<i>R-squared</i> 0.409	<i>R-squared</i> 0.503	<i>R-squared</i> 0.030	<i>R-squared</i> 0.707	<i>R-squared</i> 0.825
	<i>Effects</i>	Year	Country	Country* Year	Year	Country

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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Table A-3: Regression results for item categories 1657, 1670, and 1671.

	VARIABLES	OLS <i>ln(exports)</i>	OLS <i>ln(exports)</i>	OLS <i>ln(exports)</i>	PPML <i>exports</i>	PPML <i>exports</i>	PPML <i>exports</i>
1657	<i>ln(exporter GDP)</i>	-0.295*** (0.0110)	-0.0332 (0.0955)	-0.394*** (0.0580)	-0.149*** (0.0271)	0.424** (0.216)	-0.220* (0.128)
	<i>ln(importer GDP)</i>	0.272*** (0.0141)	0.765*** (0.106)	0.258*** (0.0561)	0.775*** (0.0306)	1.575*** (0.182)	0.921*** (0.134)
	<i>Industrial Roundwood</i>	0.0896*** (0.0262)	-0.629*** (0.0298)	-0.738*** (0.0353)	-0.173*** (0.0313)	-1.631*** (0.108)	-0.917*** (0.129)
	<i>(Non-Coniferous) Constant</i>	4.255*** (0.252)	7.240*** (1.732)	4.444*** (0.465)	5.771*** (0.389)	5.761*** (1.322)	3.753*** (1.430)
	<i>Other</i>						
	<i>Observations</i>	10,377	10,377	10,377	46,553	46,553	37,315
	<i>R-squared</i>	0.136	0.478	0.617	0.006	0.644	0.816
1670	<i>ln(exporter GDP)</i>	0.0383*** (0.00868)	-0.205*** (0.0750)	0.339*** (0.0430)	0.233*** (0.0869)	1.050** (0.500)	0.505*** (0.120)
	<i>ln(importer GDP)</i>	0.325*** (0.00996)	0.733*** (0.0749)	0.463*** (0.0407)	0.821*** (0.221)	0.983** (0.452)	0.653*** (0.111)
	<i>Industrial Roundwood</i>	-0.538*** (0.0173)	-1.276*** (0.0209)	-1.330*** (0.0223)	-0.916*** (0.249)	-2.682*** (0.150)	-2.310*** (0.0864)
	<i>(Non-Coniferous) Constant</i>	7.980*** (0.164)	12.50*** (1.143)	4.473*** (0.370)	9.339*** (1.049)	15.83*** (1.449)	10.66*** (0.802)
	<i>Tropica</i>						
	<i>Observations</i>	24,260	24,260	24,260	80,118	80,118	73,122
	<i>R-squared</i>	0.066	0.416	0.516	0.109	0.851	0.993
1671	<i>ln(exporter GDP)</i>	0.302*** (0.0115)	-0.301*** (0.0690)	0.466*** (0.0390)	0.607*** (0.0181)	-0.0394 (0.0772)	0.607*** (0.0701)
	<i>ln(importer GDP)</i>	0.380*** (0.00831)	0.634*** (0.0678)	0.490*** (0.0297)	0.972*** (0.0661)	1.032*** (0.0849)	1.161*** (0.267)
	<i>ln(distance)</i>	-0.409*** (0.0168)	-1.410*** (0.0202)	-1.401*** (0.0215)	-1.063*** (0.0635)	-1.400*** (0.0257)	-1.361*** (0.0484)
	<i>Newsprint Constant</i>	5.572*** (0.148)	11.47*** (2.139)	4.707*** (0.303)	7.286*** (0.330)	6.831*** (1.107)	1.013 (1.718)
	<i>Observations</i>	25,297	25,297	25,297	73,093	73,093	67,230
	<i>R-squared</i>	0.110	0.484	0.541	0.453	0.960	0.926
	<i>Effects</i>	Year	Country	Country* Year	Year	Country	Country* Year

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table A-4: Regression results for item category 1874.

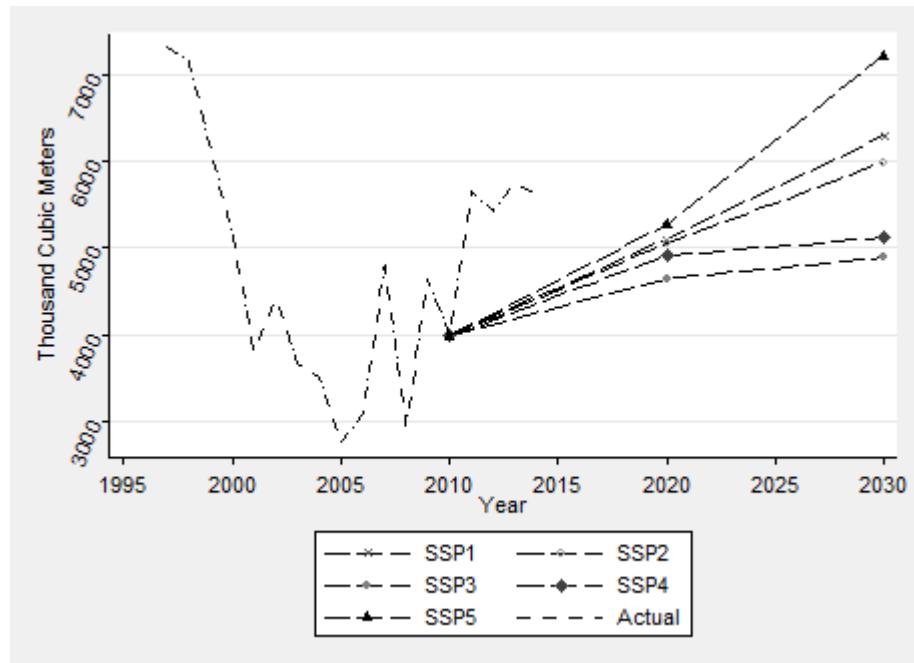
	VARIABLES	OLS <i>ln(export)</i>	OLS <i>ln(export)</i>	OLS <i>ln(export)</i>	PPML <i>exports</i>	PPML <i>exports</i>	PPML <i>exports</i>
1874 Fibreboard	<i>ln(exporter GDP)</i>	0.365*** (0.00772)	0.319*** (0.0526)	0.444*** (0.0294)	0.540*** (0.0115)	0.256*** (0.0974)	0.541*** (0.0590)
	<i>ln(importer GDP)</i>	0.388*** (0.00583)	0.793*** (0.0474)	0.544*** (0.0232)	0.663*** (0.0143)	0.801*** (0.0990)	0.916*** (0.0604)
	<i>ln(distance)</i>	-0.727*** (0.0121)	-1.501*** (0.0144)	-1.549*** (0.0145)	-0.892*** (0.0212)	-1.489*** (0.0471)	-1.537*** (0.0211)
	<i>Constant</i>	7.148*** (0.109)	10.94*** (0.883)	5.286*** (0.224)	7.588*** (0.185)	8.336*** (0.747)	3.325*** (0.427)
	<i>Observations</i>	42,495	42,495	42,495	103,612	103,601	98,117
	<i>R-squared</i>	0.161	0.432	0.509	0.273	0.589	0.710
	<i>Effects</i>	Year	Country	Country* Year	Year	Country	Country* Year

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## B. SSP Projections

Figure B-1: Projected US exports of Chips and Particles.



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Figure B-2: Projected US exports of Coniferous Sawnwood.

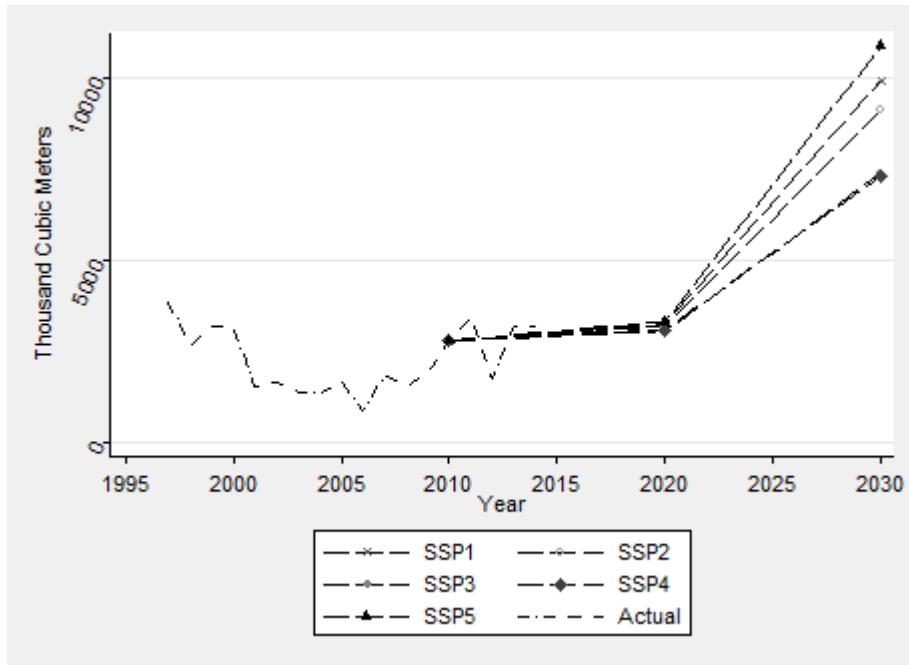
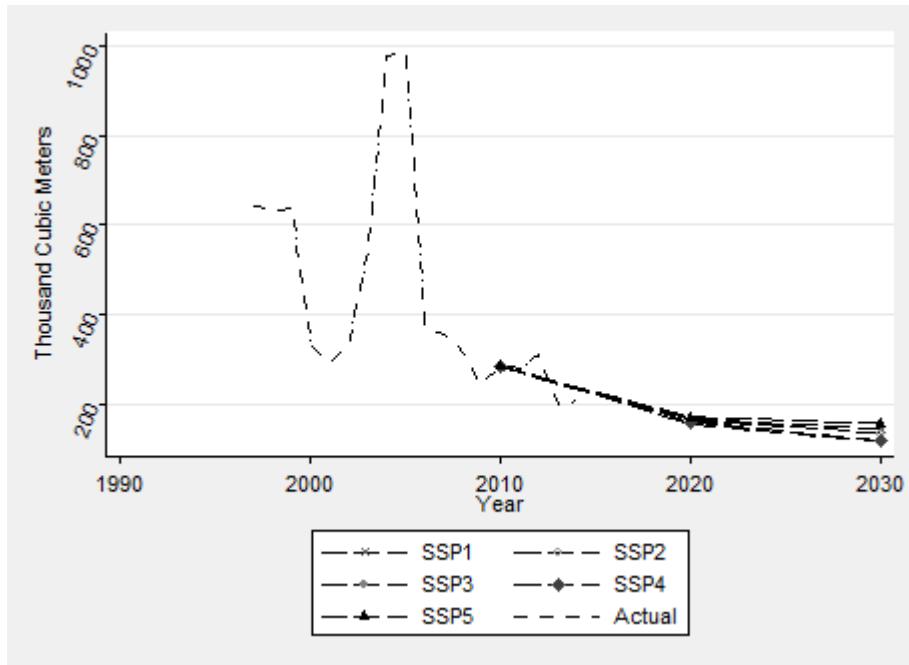


Figure B-3: Projected US exports of Veneer Sheets.



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Figure B-4: Projected US exports of Plywood.

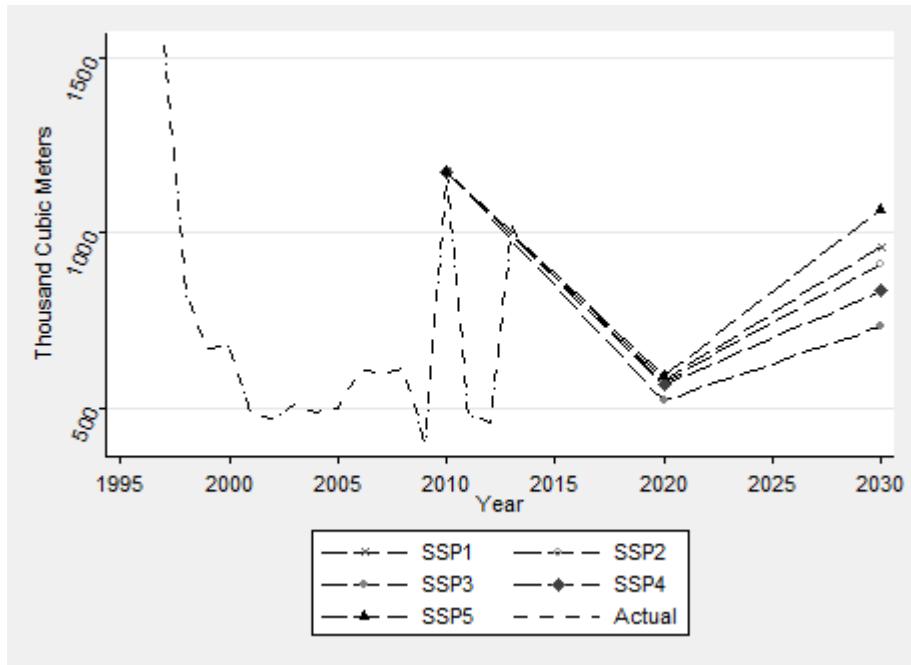
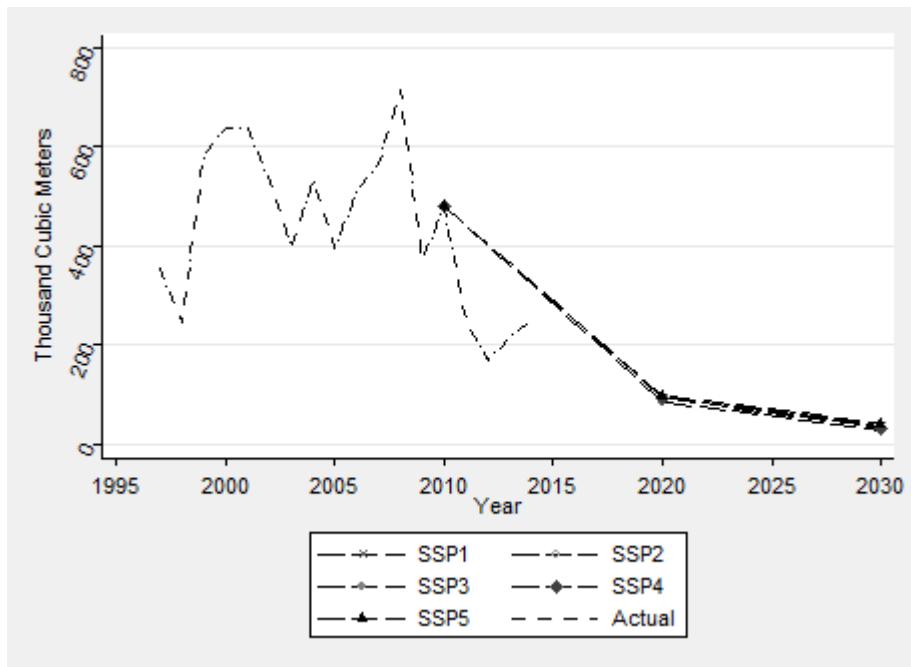


Figure B-5: Projected US exports of Particle Board.



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Figure B-6: Projected US exports of Industrial Roundwood WIR (C).

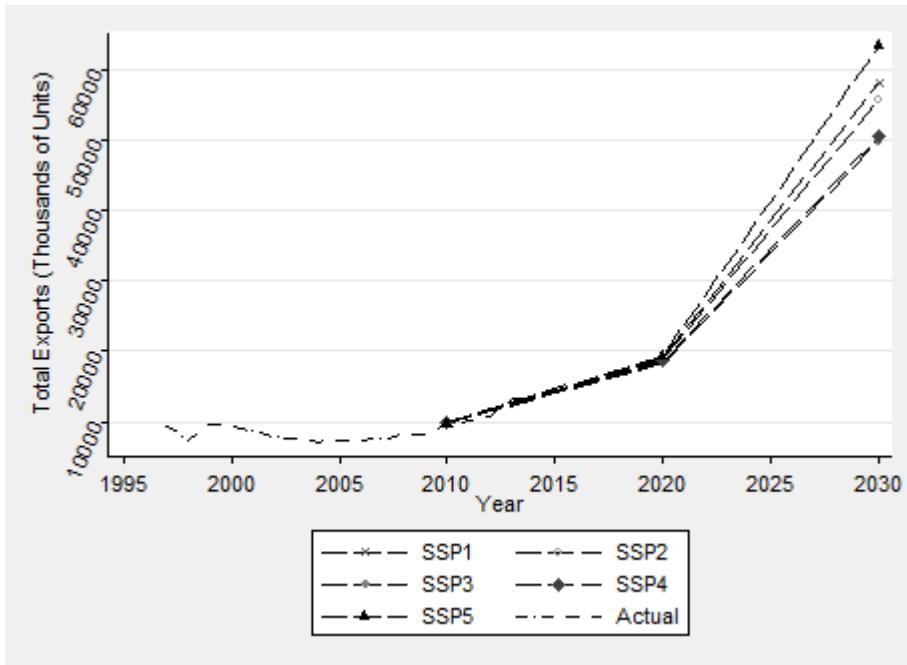


Figure B-7: Projected US exports of Industrial Roundwood WIR (NC) Tropica.

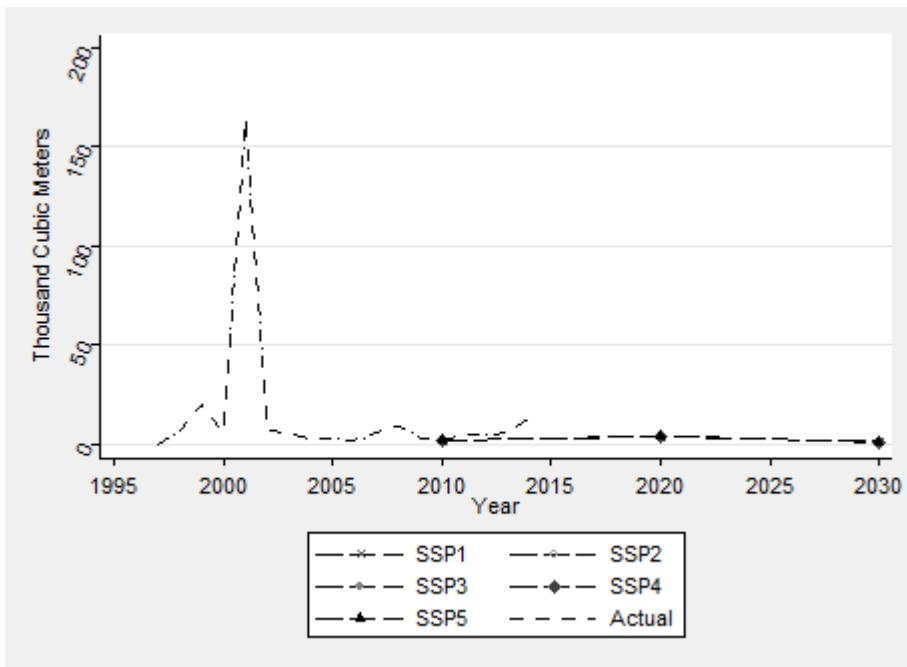


Figure B-8: Projected US exports of Industrial Roundwood WIR (NC) Other.

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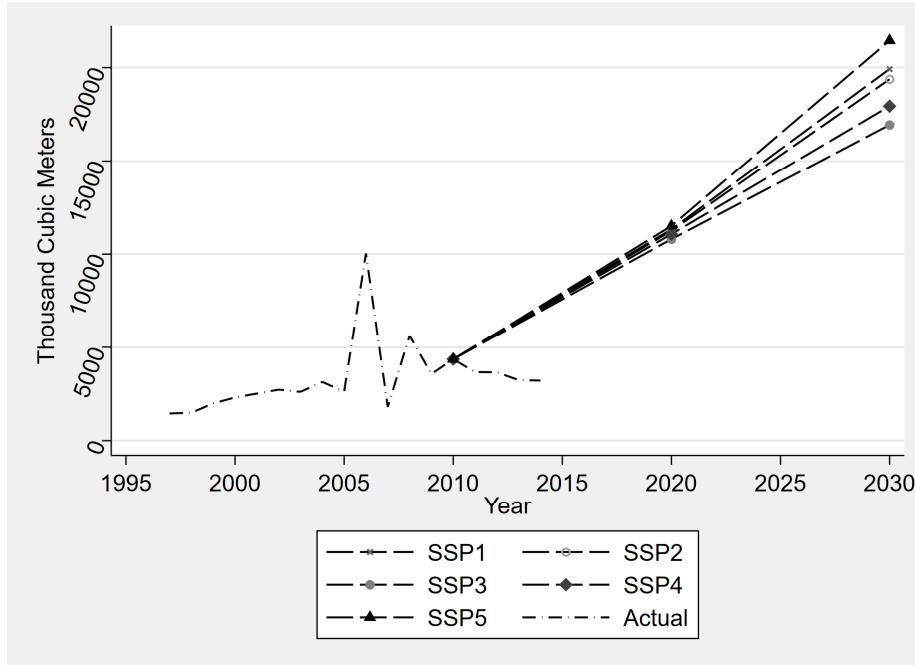
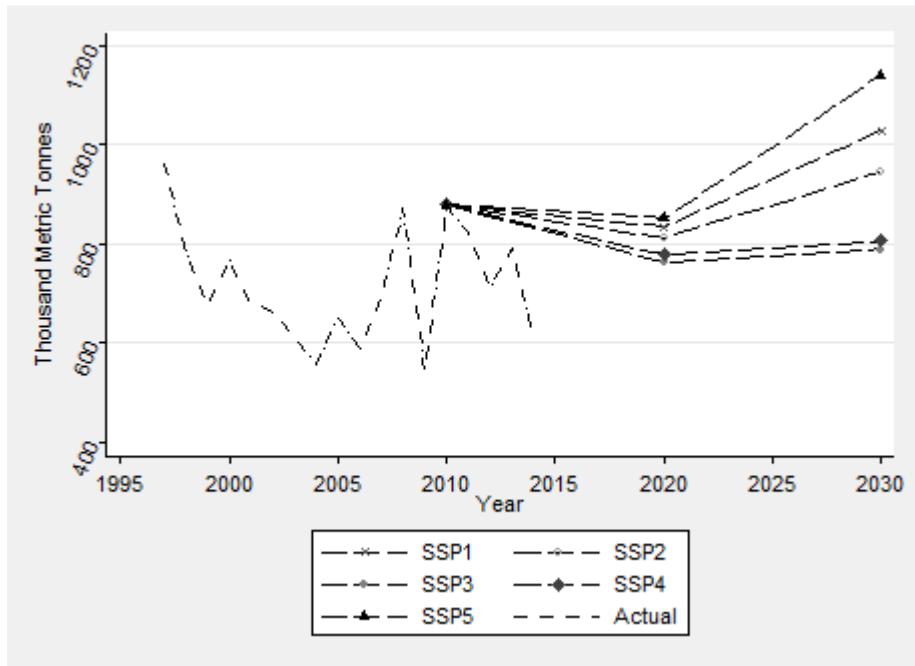


Figure B-9: Projected US exports of Newsprint.



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Figure B-10: Projected US exports of Fibreboard.

